

MANN (M.D.)

Inflammation of the Ureters
in Women.

BY

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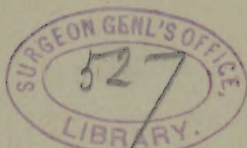


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M. D. Mann



INFLAMMATION OF THE URETERS IN THE FEMALE.

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Buffalo.

It is for the purpose of calling attention to a disease about which little has been said and written, and especially to its causation and treatment, that I have prepared this paper. I am convinced that ureteritis is common, that it is often overlooked, and that it is mistaken for other conditions in no way connected with it except in location.

FREQUENCY.—My knowledge of this disease extends over only a few years, dating from a paper by Dr. H. A. Kelly, in 1888, and a personal visit to him, in which he kindly taught me to recognize the ureters by palpation. Since that time I have met with many cases, some of them recent, but a larger number of many years' duration. Some of them I have seen only in consultation, and have no knowledge of their progress; others I have followed for a longer time.

From the number met with, I am convinced that inflammation and irritation of the ureters is exceedingly common, and that its general recognition is a matter of great importance. As yet the text-books are almost silent on the subject, the latest—Garrigues' excellent work—not mentioning it. In fact, the literature of the subject is exceedingly scanty.

In order to prepare for what I have to say, I must first refresh your memories regarding the anatomy of these important ducts.

¹ "Palpation of the Ureters," Gynecological Transactions, 1888.



ANATOMY.—The ureters are two delicate tubes, leading from the pelvis of the kidney to the bladder. They run nearly parallel as far as the brim of the pelvis. After entering the pelvis, they run downward, backward, and outward to the side of the pelvic wall, to a point near the spine of the ischium, where they hug the bone closely. Then, reversing their course, they come nearly together where they enter the bladder.

In length they never exceed fifteen inches, averaging between ten and twelve inches (Van Hook). The point of opening into the bladder is about three-quarters of an inch in front of the cervix; the points of opening are from one to one and one-half inches apart, and one inch from the neck of the bladder.

Van Hook¹ calls attention to the fact that the ureter has three points of diminution of calibre, which may give rise to mistakes in the search for pathologic stenosis. The first is between one and one-half and two and one-half inches from the pelvis of the kidney, according to Dr. Tangreary's¹ measurements. The second is at the junction of the pelvic and vesical portions; and the third (in three out of five) is where the ureter curves over the iliac artery.

It is in the latter part of their course, where they pass under the bases of the broad ligaments and through the bladder wall, that they can best be recognized by the examining finger. An exact appreciation of their position in the pelvis is, therefore, necessary before we can expect to study them. By palpation they can be recognized, especially when enlarged by disease, as two cords, running from a point a little in front of the uterus and a little to one side of the median line, directed at first toward the sides of the pelvis and then curving somewhat sharply backward until they go beyond our reach near the spine of the ischium. In front of the uterus

¹ W. Van Hook: "Surgery of the Ureters," *Journal of the American Medical Association*, December, 1893.

² Quoted by Van Hook.

their ends are separated by an inch, or a little more, of space. Tournour¹ claims that, if enlarged by disease, they can be distinctly palpated through the abdominal wall above the pelvis.

That the ureters may be the seat of disease has long been recognized. The causes and nature of their diseases are only now beginning to be studied and the diseases to be regarded as independent pathological entities.

Unquestionably the most common disease is inflammation; and I have learned by observation to recognize seven causes for this trouble, viz:

CAUSES.—1. Injuries during childbirth.

2. Previous disease of the bladder.

3. Gonorrhœa.

4. Suppuration of the pelvis of the kidney.

5. Pelvic disease, such as pelvic peritonitis, cellulitis and tumors.

6. Abnormal conditions of the urine.

7. Tuberculosis.

1. *Injuries from childbirth.* In our *Transactions*² for 1890, Dr. Skene called our attention to the first of these causes and the resulting effects. During the last winter I have met with several cases. In each there was a chill with high fever, pelvic pain, and vesical irritation, coming on several days after labor. The labors were none of them especially severe or long, but were all in primiparæ. A careful pelvic examination showed nothing wrong with the uterus, tubes, or pelvic peritoneum; but pressure over the lower end of one of the ureters showed great tenderness. After the third or fourth day an examination of the urine revealed an acid reaction with a large amount of pus and some blood. There was no mucus or other evidence of bladder trouble. As Skene points out, bimanual manipulation over the kidney on the affected side showed some tenderness.

¹ C. Tournour: *De l'Uretérite et de la Peri-uretérite.* Paris, 1886.

² A. J. C. Skene: "Injuries of the Ureters during Labor," *Gynecological Transactions.*



In none of these cases was there a history of any pre-existing disease of the bladder or kidney. In the first case I gave a grave prognosis; but the patient recovered, as did the subsequent cases. Skene met with one fatal case.

Skene considers that the cause is to be found in pressure on, or injury of, one or both ureters by the child's head or the blade of the forceps, the pendulum movement of the forceps being particularly prone to produce trouble. Especially is it likely to occur if the head pushes down an undilated cervix and the bladder with it. A most instructive account of an autopsy is to be found in the article referred to.

Besides these more serious lesions, I have noticed an irritation, lasting a long time, evidently started by the pressure of the child's head, but kept up by other causes. I shall here cite one illustrative case of this kind:

I delivered Mrs. A. some years ago with forceps, of a large child. The head was R. O. A. Following the labor she had a mild attack of sepsis, due to the retention of a small bit of very adherent membrane, from which she fully recovered. Soon after the labor she complained of a frequent desire to urinate, and it was necessary to pass the catheter quite often. This symptom seemed to persist, and her family physician tells me that he treated her for "irritable bladder" for a long time.

A few months after her recovery she was in one of our large cities, and, as her bladder began to trouble her again, she consulted one of our distinguished Fellows. He sent her back to me, advising that I sew up very slight tears in the cervix and perineum, in hopes of relieving, as he said, the tenderness in the right broad ligament (cellulitis?). On examination, I found the right ureter very tender, and the urine quite acid. I gave her large doses of alkalies, combined with an alkaline mineral water, and in a few weeks she was entirely relieved of the distressing symptoms.

Undoubtedly the trouble began in childbed, from the pressure of the head (R. O. A.) on the right ureter, and was only

relieved when all external irritation—the hyper-acid urine—was removed.

2. *Previous bladder disease.* In certain deformities of the bladder, such as fissure, the ureters are generally greatly dilated. In cystitis, except in the gonorrhœal form, extension to the ureters either does not occur or is a late manifestation. If a neoplasm or hypertrophy of the bladder obstruct the exit¹ of the urine from the ureters, dilatation of the ducts gradually takes place. "When the ureteric openings are dilated so that urine regurgitates at each vesical contraction," infection of the ureters is sure to follow with serious results.

Some authors have thought that all diseases of the ureters have their origin either in the bladder or the kidney, the ureteritis being called "ascending" or "descending," as the case may be. It has never been my fortune to see a case of ascending ureteritis, except when it has had a gonorrhœal origin. Still it may be possible that an ordinary acute septic cystitis may be conveyed to the ureters. But if this be so, in the female at least, it must be very rare. Coe² mentions having seen two cases of pyelitis follow cystitis. The course of the infection was presumably through the ureters.

3. *Gonorrhœa.* That gonorrhœa may extend to the bladder is generally acknowledged, though gonorrhœal cystitis in women is either by no means common or does not often attract attention. If gonorrhœa once reaches the bladder, the inflammation may also extend into the ureters. It is possible that after the disease has subsided in the bladder it will still lurk in the ureters, either because the conditions are more favorable, or because, the bladder symptoms attracting notice, treatment is directed to the bladder but does not reach the ureters.

I have seen several cases in which I am certain that this occurred. There was a direct history of gonorrhœa, and

¹ Skene: *Diseases of the Bladder and Urethra in Women*, p. 242.

² "Death from Visceral Affections after Ovariectomy," *Gynecological Transactions*, 1889.

other evidence in the presence of inflamed and suppurating Fallopian tubes. I have no doubt that many of the failures to obtain entire relief from pain, after coeliotomy for pus tubes, are due to coincident but unrecognized gonorrhœal ureteritis.

4. *Pyelitis and pyelo-nephritis.* Suppuration of the pelvis of the kidney and of the kidney itself is more often, in my belief, due to previous disease of the ureters than *vice versa*. Still, many cases are recorded where the disease is supposed to have been due to emboli or other trouble starting *de novo* in the kidney or its pelvis. Unfortunately, in the many recorded cases the condition of the ureters is seldom mentioned. A calculus formed in the pelvis of the kidney frequently leads to suppuration; and, with almost absolute certainty, the ureters will then, sooner or later, be involved. This is the so-called descending ureteritis. It is my experience that most of the cases in which the trouble begins in the kidney, or its pelvis, are either due to calculi or tuberculosis.

5. *Pelvic and uterine disease.* The relations existing between uterine and pelvic diseases and diseases of the ureters have been carefully worked out by Engelmann.¹ With many of his conclusions I disagree *in toto*. Time fails me to carefully criticise his paper, and I shall only allude to a few points of difference, while quoting many points of agreement.

I have very little faith in the extension of inflammation from contiguous structures, except along surfaces. I do not believe that ureteritis ever follows an inflammatory action in the tubes, ovaries, pelvic peritoneum, or parametrium by direct extension. If the two coexist, I would look either for a common cause in a gonorrhœal infection, or the ureteritis may be due to the inflammatory exudation causing pressure and obstruction.

Still less can I believe that an anteflexed fundus can, by pressure, even for a very long time and "under conditions

¹ "Renal Disease following Utero-ovarian Lesions." Gynecological Transactions, 1889.

favoring the progress of the disease," induce a ureteritis, pyelitis, and pyelonephritis.

I wish to enter my protest against what I believe is a common mistake. An anteversion or anteflexion is found, and with it a degree of vesical irritability, which is attributed to the pressure of the uterine body on the bladder. It seems to me to be ridiculous to suppose that an organ which weighs only one and one-half ounces, one-half of which is supported by the vagina, can produce so much trouble by its weight alone. Especially is this so when we see the bladder pushed out of place and pressed upon by tumors without any special symptoms of this kind. Under such circumstances, I have never failed to find some other condition to account for the vesical irritation, usually an abnormal condition of the urine.

Pressure on the ureters is recognized by all writers on this subject as a frequent cause of ureteral disease. That a sufficient degree of pressure may be made by a firm neoplasm, such as a uterine fibroid or ovarian tumor, cannot be doubted. In cancer also the disease itself, or the zone of infiltration which surrounds it, may directly press upon and even occlude a ureter. Obstruction from any cause may lead to ureteritis, pyelitis, and its consequences. In ulcerating cancer, if the disease opens the ureter, direct infection with all its results may take place.

Engelmann holds that, "above all, retroflexion and prolapsus uteri" may cause pressure on the ureters. As far as retroflexion is concerned, I have never seen any clinical evidence that this may occur; nor does it seem likely from the anatomical arrangement of the parts. The ureters are so far separated, directly behind the cervix, that there is plenty of room for an enormously enlarged retroflexed fundus between them. Where they pass over the brim of the pelvis they are well protected by the promontory of the sacrum, and are, moreover, too high for a retroverted uterus to reach them; nor is the weight of the uterus enough. In prolapse, the course of the ureters may be interfered with; but, in the

many cases of prolapse and procidentia that I have met, I have never seen anything to support this conclusion.

It is in Engelmann's third class that it seems to me the most evident connection between diseased pelvic viscera and diseases of the ureters is to be found. He claims that "functional derangement and, finally, morbid changes are produced by nervous influences emanating from the diseased pelvic viscera." This may be brought about in two ways, viz., "as reflex phenomena," or "by perverted action of the secretory nerves, due to the intimate connection of the uterine and renal plexus."

My own way of interpreting the phenomena would be as follows:

In the first place, it is well recognized that the stomach and other digestive organs bear a very close relationship, as regards their functional activity, to the sexual organs. Now, if the digestive processes are disturbed by primary disturbances in the pelvic viscera, the resulting indigestion will cause abnormal conditions of the urine. It is in this way, as I shall explain later, that I believe inflammation of the ureters is generally brought about.

Perverted action of the nerves governing the renal function often results in a deficient amount of urinary excretion. This condition, generally spoken of as "renal insufficiency," is, I believe, often a result of a stimulation of the inhibitory influence of the nerve centres due to peripheral irritation in the sexual organs. It is often found associated with ureteritis, and, I am fully persuaded, often stands in the relation of cause and effect.

6. *Abnormal conditions of the urine.* It is my belief that abnormal states of the urine cause the great majority of cases of ureteritis. The urine which is at the bottom of the trouble is excessively acid, often depositing a thick sediment on standing. It is scanty and high-colored; or this condition may alternate with a profusion of pale, limpid urine of very low specific gravity. The constant passage of this abnormal urine

irritates the whole urinary tract, and is, I am fully convinced, the most common cause of inflammation of the ureters. This particular kind of urine will at once be recognized as that characteristic of the condition often known as lithæmia. To detail the causes of lithæmia is beyond my limits.

One point I must mention again, and that is renal insufficiency. In many of these cases I have found the total amount of urine reduced to eight or ten ounces in twenty-four hours. Such urine is often of low specific gravity, showing a great deficiency in the total amount of solids excreted. It is generally acid and contains a variety of crystals. The recognition of this condition—whether we consider it only as one factor in lithæmia or as a separate affair—is of the utmost importance for the successful treatment of these cases.

Renal insufficiency being often the result of reflex action, as already explained, we must look for the exciting cause; and this we may find in the pelvic organs or in some distant organ, as, *e. g.*, in the eye. If it be in the pelvis, or wherever it may be, we shall make little progress in the management of our case until we recognize the cause.

I have noticed that some kinds of fruit seem to cause a state of the urine which is particularly obnoxious to the urinary mucous membranes. Strawberries are especially noticeable in this respect.

7. *Tuberculosis.* Tuberculosis as a cause of diseases of the ureters has been occasionally recognized.

The case of a young girl came under my notice a year or more ago. The ureters were enormously enlarged, and there was much pus in the urine. I turned her over to Dr. Charles G. Stockton for general treatment, and Dr. Bergtold found tubercle bacilli in the urine. She later went to New York, where her kidney was opened, and a condition was found which was called tuberculous pyelitis. A few months ago Dr. Roswell Park removed this kidney, finding numerous foci of pus and other evidences of tuberculous disease.

It may be questioned whether tuberculous disease of the

ureters exists independently of the same disease in the kidney.

PATHOLOGICAL ANATOMY.—I have had no opportunities of studying this disease post-mortem, and have not had access to any work treating fully the pathological anatomy of the ureters. Judging from what I have observed clinically, and from the reports of cases by other observers, I think that we may distinguish several forms or stages of ureteritis.

First is the catarrhal form, in which there is a little swelling of these tubes with desquamation of the epithelial lining. It is my belief that in slight cases, judging from the evidence gained by examination as well as from the symptoms, the force of the disease is first spent on the lower end of the ureter, especially the part in front of the broad ligament.

In other cases the surface of the tubes seems to give forth a plentiful purulent secretion, which indicates an ulcerated or granulating condition of their lining membranes. Tournour says that when these ulcerations occur a thickening in the surrounding connective tissue takes place with, perhaps, adhesions of the peritoneum, giving an irregular outline to the course of the ureters.

Sometimes the tube is greatly thickened by inflammatory deposits in the walls. This may reach a point where the ureters are as large as a lead-pencil, or even larger. In the case of obstruction, dilatation, even to an extreme degree, may take place, accompanied by a certain amount of thickening. Tournour likens these dilated and thickened ureters to the arteries in a cadaver.

I have now under observation a case in which the ureters are greatly thickened, and in which the right one seems to be dilated or sacculated just behind the broad ligament.

The pelvis of the kidney is doubtless generally more or less involved with the ureters; but that it is always so is not proven. A physical examination in several cases of so-called "pyelitis" has shown that the ureters were the parts chiefly involved. That these conditions may end in the involvement

of the pelvis and of the kidney itself I have had clinical evidence. In several cases peri-nephritic abscesses have developed, and in two abscess of the kidney has developed, as proven by operation.

Usually both ureters are involved in the pathological processes, but often one side—usually the left—is much more seriously affected than the other.

COINCIDENT AFFECTIONS OF OTHER ORGANS.—The bladder is rarely directly affected by coincident inflammation—that is, there is seldom a general cystitis. But in a patient recently examined, in whom the pain and tenderness are confined to the left side, the surface of the bladder around the mouth of the ureter, as shown through a Kelly's speculum, was quite red and congested. The ureteral orifice on this side is only half the size of that on the unaffected side.

In another case there was a patch of granulations around the orifice of the right ureter as large as a twenty-five-cent piece. The possible existence of stricture at the point of opening is something to be considered.

It is a matter for future investigation whether the vesical tenesmus is not always due to some localized congestion, granulations or ulceration around the mouth of one or both ureters on the bladder wall. In consequence of the constant emptying of the bladder, its walls may become contracted and almost incapable of expansion. This fact must be taken into consideration in the treatment, and means taken to overcome the contraction.

Other complications are the various forms of tubal, ovarian, and uterine disease. Endometritis is the commonest. Retroversion and prolapse are not uncommon. But, in a considerable number of the cases met with, the sexual organs have been only slightly affected.

It will be at once admitted that some of the conditions described as producing ureteritis will also in time produce changes in the kidney, especially contracted or granular kidney. This makes the disease a more serious one. Whether

there be any relation between floating, or movable, kidney and ureteritis, I am unable to say, never having met with a case in which the two conditions coexisted.

Late in the disease abscesses, either in or around the kidney, or else around the ureter, may form. I have seen several instances of peri-nephritic abscess, and one which, I think, had its origin in the cellular tissue around the ureter. It pointed in the iliac fossa.

SYMPTOMS.—The most constant symptom is frequent micturition, which may even become continuous. In only a very few cases with which I have met has this symptom been absent. The desire is most frequent during the day, but the rest is often broken by calls to empty the bladder at night. In the worst case I ever saw, when I was summoned the woman had been sitting on a commode for a month, night and day, only occasionally snatching a moment's sleep. The desire to urinate was constant.

In this case the ureters were as large as lead-pencils and exquisitely tender; there was pus in the urine, but the bladder seemed to have the usual tolerance—that is, there was no special pain on distending it with fluid. Relief was obtained, however, by the establishment of a vesico-vaginal fistula.

The next symptom in importance is pain over the ureters, one or both, the left side being more commonly affected than the right. This pain is described as burning or boring, and is nearly constant, but is almost always aggravated as the menses approach, even becoming agonizing during the flow. This peculiarity has often led to an error in diagnosis, the disease of the ureters being mistaken for ovarian disease. *Several patients have come to me to have their ovaries removed when all the trouble lay in the ureters.* One patient in particular had been examined by several excellent men, all agreeing that the ovaries were the seat of the intolerable menstrual pain, and ought to be removed. When I last saw the woman she still possessed her ovaries and was perfectly well.

One curious symptom I have noted as frequently existing

in cases associated with renal insufficiency, *i. e.*, an absolute distaste for water. I have frequently told the patient, without asking her, that she did not drink water enough, and she has replied that she did not drink any. In some cases water seems actually to produce nausea. This distaste for water is often very hard to overcome.

Should cystitis coexist, the symptoms of this disease may entirely mask the other. Again, should the kidneys become affected, a new train of symptoms will arise. In lithæmic patients other manifestations of the condition may develop. Many of these patients are subject to bilious attacks and sick-headaches. Gastric and intestinal dyspepsias are common, and there is often a history of inherited rheumatism or gout. Great depression of spirits is not an uncommon symptom. Even in the lithæmic cases the symptoms often seem to date from childhood.

Sometimes the disease is intermittent, attacks coming now and then, but usually it runs an essentially chronic course. I have met with cases which had lasted for twenty years, gradually getting worse, until life was very nearly unendurable.

The pain is sometimes steady, and again it is spasmodic. It may be stationary over the ovarian region, or it may be felt over the hip and down through the iliac fossa. In some cases the pain is intensified by walking; others are unable to ride in any vehicle, the jar and movement causing much pain.

Attacks of gravel or the passage of small stones from the pelvis of the kidney are rather common, and may be distinguished by the usual symptoms. In some cases the passage of plugs of inspissated pus produces symptoms similar to those of gravel.

DIAGNOSIS.—This disease may be recognized, first, by the symptoms enumerated; secondly, by the physical examination; and, thirdly, by an examination of the urine.

It is needless to go over the symptoms again; only it must be remembered that they do not give conclusive evidence.

As already stated, the symptoms may be mistaken for those of ovarian, tubal, and uterine disease, on the one hand, and for those of the bladder and kidney on the other. It must be borne in mind that frequent micturition is not always present.

It is on the physical examination then that we must place the chief reliance. That the ureter is often easily palpable has been clearly demonstrated. Pawlik, H. A. Kelly, and others have, by their teaching and writing, established this fact conclusively. In fact, there is nothing easier than the palpation of an enlarged ureter in the pelvis. When it is not enlarged, the matter is not so easy; and I am convinced that it is not possible to perfectly and clearly distinguish the ureters in all women. If, however, we know their anatomical position, and pressure over these points—and over these points alone—elicits pain, we may, if the symptoms are corroboratory, safely infer that we are pressing upon the ureters and that they are diseased. Care must be taken not to confound tender spots in the other structures of the pelvis, so frequently discoverable, for the ureters.

METHOD OF PALPATION.—*Pelvic.* The palpation of the ureter in the pelvis is done as follows:

The finger is carried along the anterior vaginal wall upward and outward near the brim of the pelvis to one side of the uterus. It is then passed forward, stroking the pelvic wall and carefully feeling for a cord-like body under it. Sometimes a bimanual examination will greatly aid in discovering the ureters. Anybody who has once distinguished an enlarged ureter will be astonished at the ease with which it may be done.

In every case that I have seen, tenderness on pressure was present, and sometimes to an extreme degree. A feeling of a desire to urinate is often complained of on touching the ureters, and Kelly describes a case in which micturition took place over his hand while examining.

By tracing the course of the ureters carefully with the

finger-tips disease of the bladder and urethra may be excluded. Should bladder trouble coexist, it will be hard to distinguish the ureteral disease, unless the ureters are enlarged, or at least distinctly palpable. If they are not, then it may become necessary to obtain urine for examination directly from the ureters by the passage of the urethral catheter.

Abdominal palpation. As already mentioned, Tourneur¹ lays great stress on the palpation of the ureter through the abdominal wall. He says: "At the level of the superior strait the ureter can be found at one-third the distance which separates the anterior superior spines of the ilium."

In women who have borne children, and have, in consequence, a relaxed abdominal wall, he claims that it is astonishingly easy to palpate the enlarged and thickened ureters. If there be a peri-ureteritis, the investigation is further facilitated; and in some cases irregularities or swellings are noted along the course of the ureters. If there be simple dilatation without hypertrophy, palpation is more difficult. He considers this as the principal method of determining the changes in the form and consistence of the ureters, and consequently of the utmost importance. He cautions us to be careful not to mistake a chain of enlarged glands (the ileo-lumbar) for the enlarged and irregular ureters. These glands are especially likely to be affected in tuberculous disease.

His method would seem to supplement the pelvic palpation. For its performance it is necessary that the bowels should be thoroughly emptied, and that the patient should lie on a hard table, with the knees drawn up to relax the abdominal muscles. I have never practised abdominal palpation of the ureters.

EXAMINATION OF THE URINE.—This is an absolute necessity, both for diagnosis and as giving important indications for treatment. No examination can be considered as complete unless it embraces an estimation of the amount of urine passed in twenty-four hours, as well as a careful chemical

¹ Loc. cit.

and *microscopical* examination. Many practitioners consider that when they have tested for albumin they have done their whole duty. Such a test is practically useless, showing nothing regarding the abnormalities to be met with in ureteritis.

The urine will often be scanty. I have seen it as low as six ounces in twenty-four hours; always acid in reaction; often hyper-acid, unless cystitis coexist; and often of low specific gravity, 1010 to 1015.

The sediment will consist of urates, uric acid, calcium oxalate, often pus, and a little epithelium. All attempts to locate the seat of the disease by the presence of peculiar types of epithelial cells will fail. In old cases, where pus is present in large amounts, no epithelium will be found. Blood-cells in greater or less proportion will often be found with the pus.

The amount of mucus in the urine will be very slightly increased. There are no mucus follicles in the pelvis of the kidney or ureters. As the bladder is abundantly supplied with such follicles, the presence or absence of mucus is of much diagnostic value. Urine containing pus without mucus, and acid in reaction, is, I believe, a sure indication of inflammation in the urinary tract above the bladder, leaving out, of course, the presence of an abscess opening into the bladder. On the other hand, alkaline (ammoniacal) urine with mucus and pus is a sure sign of cystitis, but does not exclude involvement of the ureters or pelvis of the kidney.

Palpation (or catheterization) of the ureters is then the only resource for deciding whether the ureters are also involved. The presence or absence of albumin may be of some significance. I have never found anything more than the faintest trace of albumin in purulent ureteritis; generally there is none.

The presence of albumin with pus may mean, then, either that the kidneys are affected, or that the pus comes from an abscess cavity, the liquor puris furnishing the albumin. The further history of the case will decide which.

It is by no means necessary that the ureters should be much thickened before pus is produced. I have seen it in comparatively recent cases where the ureters were not at all enlarged, only tender. Under proper treatment these cases rapidly recover.

PROGNOSIS.—The prognosis in a given case of inflammation of the ureter depends entirely upon the stage in which the disease is met with and upon the condition of the ureters as recognized by palpation. If the trouble has not lasted very long, and the ureters are not much thickened or enlarged, the prognosis is good, though the time necessary for a cure will be considerable. In old chronic cases, where great thickening of the ureters has taken place, and where large amounts of pus are found in the urine, the outlook for the patient is certainly not good. It is altogether likely that abscesses will form in or around the kidney, and that the patient will succumb from them, or, later, from some form of Bright's disease.

Nevertheless, I have seen one case, which I have followed now for nine years, in which the patient has apparently recovered. The trouble began, I infer, with lithæmia and a mild ureteritis, while she was under my care. This was entirely unrecognized and was not properly treated. The ureters gradually got thicker, and when I examined her again, some four years ago, I found them moderately enlarged, the disease having then, judging from the symptoms, lasted about five years. Later, she had an abscess of the right kidney, which was opened and drained, and which left a sinus. Finally the kidney was removed, and the patient is, I understand, now perfectly well. The other ureter, however, is slightly thickened, and may ultimately give trouble.

As already stated, I have seen cases which have lasted twenty years, judging from the symptoms, in which there was only moderate thickening and a small amount of pus in the urine. Other cases run a much more rapid course. It will thus be seen that a prompt recognition of these cases and a proper treatment is of great importance.

TREATMENT.—The treatment may be considered under these heads :

1. Constitutional.
2. Local.
 - a. Through the urine.
 - b. Direct local treatment.
3. Surgical.

1. *Constitutional.* From what has been said regarding the causation of this disease, it will at once be seen that constitutional treatment is of the utmost importance. Unless this is carefully carried out we cannot expect to get a normal condition of the urine, which is absolutely essential, not only to prevent the further progress of the disease, but also to favor a cure.

To this end the patient should be put in the best possible environment ; she should have perfect freedom from mental worry and anxiety, in a situation where she can have plenty of outdoor air and exercise, and where everything shall be done to promote the general health. A careful regulation of the diet is absolutely necessary, even where the case is of gonorrhoeal origin ; for the urine must be kept bland and unirritating under all circumstances. In many cases sugar and starches seem to be very poorly digested. They thus do harm, and are to be avoided. Alcoholics, especially wine and beer, must be given up.

In cases where the kidneys are not acting freely, or where there is marked renal insufficiency, the use of hot-air baths—either the regular Turkish bath, or, better still, the bath given with an alcohol lamp placed under the chair, the patient being swathed in blankets—will produce good results. By this means the skin is made to do duty for the kidneys, and the poisonous excretions which have been retained in the blood are gotten rid of. Moreover, the dry hot-air bath acts as a derivative, drawing the blood to the surface, thus lessening the congestion of the internal organs. Under this treatment the kidneys will quickly resume their work, and the amount of

urine will be increased very markedly, notwithstanding the profuse sweating. Massage is also of great use in many of these cases, and can be used directly after the hot-air bath.

Under all circumstances, but especially where there is renal insufficiency, I advise the free use of water. The psychical effect is often better if we use a mineral water; but I do not believe that any of the waters in the market contain a sufficient amount of alkali to do very much good. It is the water, and not so much the mineral ingredients that it contains, that accomplishes the result. I have very little faith in diuretics.

The use of alkalies is of the utmost importance, and they should be used long and persistently, in sufficient quantity to keep the urine alkaline, or at least neutral. For this purpose I have used the liquor potassæ in doses of five drops or more; also the acetate and citrate of potassium, and Rochelle salts and bicarbonate of soda. In many instances the salts of lithium are of great value. Etheridge¹ advises lithium combined with potash to increase the flow of urine. In some cases one agent, and in others another, acts best. A little trial will prove which has the best effect with each particular patient.

Agents which act upon the liver, especially where there is constipation, are also very useful. To this end I have used podophyllin, leptandrin, euonymin, and other agents of this nature. The greatest care should be taken to see that the bowels act freely. Where there is a history of constipation, flushing of the colon is of inestimable value.

If anæmia exists, the use of iron and arsenic will be beneficial.

It is not necessary for me to enlarge further upon this matter, only to insist that everything must be used to restore the patient's general system to a normal condition. In several comparatively recent cases, other means having failed, I

¹ Personal communication.

have seen the greatest amount of good come from an exclusive milk diet. This must be kept up until the symptoms are entirely relieved and the pus disappears from the urine. A number of patients have been entirely cured in this way.

2. *Local. a. Through the urine.* It is well recognized that certain agents are excreted through the urine and have an influence upon the membranes over which they pass on their way out of the body. The various agents ordinarily used in gonorrhœa, such as copaiba and sandalwood oil, have in several instances proven beneficial, especially where there is a great deal of pus in the urine. Sandalwood I have found especially valuable.

I have also tried carbolic acid, salol, and hydronaphthol with the idea of getting their antiseptic action upon the ureters, or their germicidal action in the urine as they pass out. I cannot say that I have seen any great results from the last-named group; in fact, we are greatly in need of a drug which, when given by the mouth, will produce an antiseptic action in the urine. Benzoic acid, perhaps, comes as near as anything; but, as it produces an exceedingly acid state of the urine—hippuric acid being excreted—it does not seem exactly indicated. Its beneficial effect in cystitis with alkaline urine is well known; but I have not seen the same results in ureteritis.

Tourneur praises the essence of turpentine in capsules, two to six, or even eight, a day. He considers that turpentine renders the urine less irritating and at the same time notably increases the amount.

b. Direct local treatment. The discoveries and inventions of Dr. Howard A. Kelly¹ have opened up a new field for the local treatment of diseases of the ureter. By his method, it is now in the power of everyone to pass an instrument into the ureters with comparative ease. An operation which was

¹ "The Direct Examination of the Female Bladder," etc., American Journal of Obstetrics, January, 1894.

formerly considered very difficult, even for an expert, is thus brought within the reach of all; and, though sufficient time has not yet elapsed for us to have formulated any particular plans of treatment, or to have tested any special drugs, still the general principles of the treatment of inflamed mucous membranes may be applied here. I have recently dilated and catheterized the ureters through Kelly's speculum, and shall experiment in the action of various drugs. Of course it will be necessary to go slowly, as we have no means of knowing as yet what the susceptibility of these structures is to the different agents. I propose to try injections of boric acid, weak solutions of nitrate of silver, and so on, and see what can be accomplished in this way.

3. *Surgical treatment.* Much has been written lately in regard to the surgery of the ureters. As yet, however, very little has been done for the application of surgery to their treatment. Personally, I have no experience with anything of this nature further than catheterizing and dilating the ureters. This I have done a few times, and from it alone have never seen any great results, although one case in which I dilated the ureters with the catheter passed through the bladder was very much relieved of her pain for a considerable length of time. After about a year the old trouble returned; and before the patient could come to me for a repetition of the operation she died.

TREATMENT OF THE BLADDER.—In one case—the one which I noted on a previous page as having had almost continuous *ardor urinæ*—I procured great relief by making a permanent vesico-vaginal fistula. After that was done, the patient was able to leave her commode, to lie down and to sleep well. She died, however, of an abscess which started either around the kidney or outside of the ureter, and opened in the iliac fossa.

In another case in which I opened the bladder, the ureteritis being at that time unrecognized, no relief followed. The patient afterward put herself under the care of a very distin-

guished member of the American Gynecological Society, but received no benefit, and, I think, ultimately committed suicide, owing to the severity of her symptoms.

If the bladder be much contracted and very irritable, benefit can often be obtained by distending the bladder with fluids. For this purpose, weak salt solutions can be used, or solutions of boric acid, or other similar agent. If there be granulations around the ureteral openings, congested areas or ulcerations, they can be treated topically by the aid of Kelly's speculum. I have recently scored a brilliant success in the local treatment of such a case.

From what has already been said, it will be seen that much more research is necessary before we can arrive at a truly satisfactory treatment of this affection. If, however, I can succeed in rousing the attention of the profession to its existence and to the necessity of recognizing and treating it, I think that the beginning of the end will have been reached.

